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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/992,767 12/17/97 YOKOYAMA

H NEC-19654

MM42/0208
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EXAMINER

WILLE, D

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 02/08/00

Please find below and/or attached an Office communication concerning this application for proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

08/992,767

Applicant(s)

Yokoyama

Examiner

Douglas Wille

Group Art Unit

2814

☒ Responsive to communication(s) filed on Dec 27, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-10 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-10 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Finality of Prior Office Action

Finality of the prior Office Action is withdrawn.

Claim Rejections - 35 USC § 103

- 1 The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
- 2 Claims 1 - 4, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsoi et al. in view of Roberts et al. and Miller et al.
- 3 Tsoi et al. show (see Figure 11 and column 2, line 1 et seq.) a structure with different sized vias 66, 67 for contacting different portions of the device where 66 is made larger to improve the contact (column 5, line 15). Roberts et al. show (see cover Figure and column 2, line 37 - column 7, line 12) a structure with a wide via (low aspect ratio) in an insulating layer 12 where a tapered refractory metal layer 30 is formed in the corners of the hole to improve step coverage of the metal film 40 and the upper end of the hole is funnel shaped. Miller et al. show (see cover Figure and column 5, line 22 - column 6, line 30) the filling of a high aspect ratio hole (column 2, line 43) with a refractory metal plug. It would have been obvious to include a technique for filling a high aspect ratio hole along with an approach to filling a low aspect ratio

Art Unit: 2814

hole to provide a technique for providing both sized vias in a regime where the hole size is small enough to cause concern.

5. Claims 1 - 4, 7 and 8, in so far as they are understood, are rejected under 35

U.S.C. 103(a) as being unpatentable over Tsoi et al. in view of McDavid and Miller et al.

6. Tsoi et al. show (see Figure 11 and column 2, line 1 et seq.) a structure with different sized vias for contacting different portions of the device where 66 is made larger to improve the contact (column 5, line 15). McDavid shows (see cover Figure and column 2, line 19 - line 61) a structure with a wide via (low aspect ratio) in an insulating layer 21 where a tapered refractory metal layer 13 is formed in the corners of the hole to improve step coverage of the metal film 10 and the upper end of the hole is funnel shaped. Miller et al. show (see cover Figure and column 5, line 22 - column 6, line 30) the filling of a high aspect ratio hole (column 2, line 43) with a refractory metal plug. It would have been obvious to include a technique for filling a high aspect ratio hole along with an approach to filling a low aspect ratio hole to provide a technique for providing both sized vias in a regime where the hole size is small enough to cause concern.

7. Claims 5, 6, 9 and 10, in so far as they are understood, are rejected under 35

U.S.C. 103(a) as being unpatentable over Tsoi et al., McDavid and Roberts et al. in view of Miller et al.


8. McDavid shows a refractory layer which is high in form and Roberts et al. show a refractory layer that is low in form. Since both show a useful structure it would have been obvious to use any form in-between the two.

Art Unit: 2814

Conclusions

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A. Wille whose telephone number is (703) 308-4949.

10. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose number is (703) 308-0956.


Olik Chaudhuri
Supervisory Patent Examiner
Art Unit 2814

DAW *Dave*

January 31, 2000